

CLAIMS

1. A method of computing a contour comprising the steps of:
inputting a plurality of points, each point being indicative of a predetermined
5 landmark point in an image;
deriving a preliminary contour based on the input points and a known average
contour shape; and
deforming the preliminary contour to fit features identified in the image to
obtain the computed contour.
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2. A method according to claim 1, wherein the number of inputted points is fewer
than the number of points needed to define the shape of the computed contour.
3. A method according to claim 1 or 2, wherein the number of degrees of freedom
15 defined by the inputted points is fewer than the number of degrees of freedom needed
to define the shape of the computed contour.
4. A method according to claim 1, 2 or 3, wherein the known average contour shape
is obtained using a database of contours derived from previous images.
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5. A method according to claim 1, 2, 3 or 4, wherein the deriving step comprises
applying a parametric model to transform the known average contour shape such that
the landmark points of the average contour shape match the corresponding input
points.
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6. A method according to claim 5, wherein the deforming step comprises deforming
the preliminary contour by applying the same parametric model as in the deriving
step.
- 30 7. A method according to claim 5 or 6, wherein the parametric model is a

deformation model derived from a statistical shape model constructed from a database of contours derived from previous images.

8. A method according to any one of the preceding claims, wherein the contour
5 represents the boundary of an item of interest in the image.
9. A method according to any one of the preceding claims, wherein the image is an anatomical image.
- 10 10. A method according to claim 9, wherein the image is an image of the heart.
11. A method according to claim 10, wherein the image is a long-axis view of the heart.
- 15 12. A method according to claim 10 or 11, wherein the contour represents the endocardial boundary of the left ventricle of the heart.
13. A method according to claim 12, further comprising the step of calculating the volume of the left ventricle.
- 20 14. A method according to any one of claims 10 to 13, wherein the predetermined landmark points in the image comprise: the root of the left mitral valve leaflet, the apex of the left ventricle, and the root of the right mitral valve leaflet.
- 25 15. A method according to any one of the preceding claims, wherein the number of inputted points is exactly three.
16. A method according to any one of the preceding claims, wherein the image is an image created using a modality selected from the group consisting of ultrasound,
30 nuclear medicine, X-ray and magnetic resonance imaging.

17. A method of computing the motion of a contour, for a temporal sequence of images of a subject, comprising the steps of:

computing the contour for one image of the sequence according to the method of anyone of the preceding claims;

5 using the computed contour as a new preliminary contour for a further image in the sequence;

deforming the new preliminary contour to fit features identified in the further image to obtain the computed contour for the further image; and

10 repeating the using and deforming steps to obtain a computed contour for each image in the sequence.

18. A method according to claim 17, wherein the computed contours represent the endocardial boundary of the left ventricle of the heart, further comprising the steps of: calculating left ventricle volumes from the computed contours; using the
15 calculated volumes to calculate at least one of the stroke volume and ejection fraction of the heart.

19. A computer system comprising a data processor, a data storage means, input device and a display, the data processor being adapted to process data in accordance
20 with an executable program stored in the data storage means, wherein the executable program is adapted to execute the method of any one of the preceding claims on data representing the image displayed on the display and using the plurality of points indicative of predetermined landmark points in the image input with the input device.

25 20. A computer program comprising program code means for executing on a computer the method of any one of claims 1 to 18.

21. A computer program product carrying the computer program of claim 20.